

### **REMARKS**

Claims remaining in the application are 1-8 and 10-22. Claims amended are 1, 5-8, 10, and 22. Claim 9 is cancelled. Claim 23 is new. Claims 3, 4, and 11-21 have been allowed.

#### **Rejection Under 35 U.S.C. § 102**

The Office Action has rejected claims 1 and 2 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,379,069 to Tani. This rejection is respectfully traversed.

The Tani '069 disclosure describes a video recorder having dual CCDs, one for luminance detection, one for chrominance. The recorder apparatus disclosed in Tani '069 is directed to obtaining a high-resolution luminance signal rather than to obtaining an image with an expanded color gamut. For the purpose of obtaining an improved luminance signal, color filters would have overlapping spectral pass bands. For expanding the color gamut of an imaging device, on the other hand, it is known that the most desirable arrangement is to capture colors in spectral pass bands that are substantially nonoverlapping. This is not the approach used in the Tani '069 apparatus and method, where the fourth color is used primarily to obtain a higher resolution luminance signal.

In light of the Office Action's objection and in order to more distinctly claim the apparatus of the present invention, claim 1 is amended to more particularly indicate the non-overlapping nature of the spectral regions for each element.

The Office Action has rejected claims 5 and 22 under 35 U.S.C. 102(e) as being anticipated by Yu et al., U.S. Patent No. 6,611,289. This rejection is respectfully traversed.

The Yu et al. disclosure shows a digital camera with multiple image sensors. Three of the image sensors are configured with transmissive filters for red, blue, and green light, (column 5, lines 14-27). The fourth image sensor accepts white light for obtaining a luminance signal. A filter may be provided for obstructing non-visible light for this fourth sensor. However, this fourth sensor does not detect a narrow color wavelength, as is true for the other image sensors. Because this fourth sensor is intended for white light level sensing, it is not useful for increasing the color gamut of the camera. Instead,

because it accepts light of all visible wavelengths, the fourth sensor would only serve to reduce color gamut if data obtained by that sensor were used for color detection. As would be readily apparent to one skilled in the color reproduction arts, in order to expand the color gamut of a color imaging device (as shown in Figure 1), the colors that are sensed must be substantially non-overlapping.

The apparatus of the present invention as claimed in claims 5 and 22, meanwhile, employs separate digital cameras, wherein each digital camera detects light over a narrowly defined spectral region, with the respective regions being substantially non-overlapping. This limitation of each digital camera to a narrow spectral region allows for the expanded color gamut as shown in Figure 1 of the present application. Claims 5 and 22 are amended as noted to more explicitly claim this bandwidth-specific light sensitivity of each of the four digital cameras.

The Office Action has rejected claims 6 and 7 as being anticipated by Hjortzberg, U.S. Patent No. 4,404,585. This rejection is respectfully traversed.

With respect to claim 6, the Hjortzberg disclosure shows and describes a color filter wheel having filters for up to four spectral regions. However, there is no indication that these spectral regions are non-overlapping, which is necessary for gamut expansion, as noted above. Instead, the Hjortzberg disclosure shows opposed complementary colors: Red, Yellow, Cyan, and Blue, where overlap between regions is not excluded. This non-overlapping characteristic would be necessary for a solution that expands the overall color gamut of the camera. In light of the Office Action's objection and in order to more distinctly claim the apparatus of the present invention, claim 6 is amended to more particularly indicate the mutually non-overlapping nature of the spectral regions for each element.

With respect to claim 7, the Hjortzberg disclosure describes a video sequential four-color camera system using a color filter wheel. At each filter position of the four-color filter wheel (16), the image sensor (14) of the Hjortzberg device scans the scene to obtain the scene content within the transmission band of the color filter wheel.

While the speed of the color filter wheel may be variable and its position known to sensing logic, this device is not an electronically switchable color filter such as the ColorLink Inc. device referenced in the specification (page

8 lines 18-21). The color filter wheel simply rotates each absorptive filter into position for a time interval needed to obtain the image within the given color range. This is significantly different from the electronically switched LCD color filter that is an electro-optic device. Claim 7 is amended to indicate that the electronically switchable filter is an electro-optic device.

The Office Action has rejected claim 10 as anticipated by U.S. Patent No. 6,373,523 to Jang. This rejection is respectfully traversed.

In the apparatus of the Jang '523 disclosure, multiple color filters are arranged at each of two camera systems. One color camera uses magenta, green, and cyan, the other uses magenta, green, and yellow. Thus, there is some overlap in the color information obtained at each camera system. The apparatus of the present invention, however, employs a pair of color filters at each camera, wherein the color transmissive regions of these color filters are non-overlapping. Claim 10 is amended to indicate that first, second, third, and fourth color filters are non-overlapping.

#### **Rejection Under 35 U.S.C. § 103**

The Office Action has rejected claim 9 under 35 U.S.C. 103(a) as unpatentable over U.S. Patent No. 4,281,339 to Morishita et al. in view of U.S. Patent No. 5,917,560 to Neumann. This rejection is respectfully traversed.

The Neumann '560 disclosure describes a projector, rather than a camera. This disclosure shows the conventional use of an X-cube beamsplitter for combining three primary colors (Red, Green, and Blue) onto a single projection axis. The present invention, on p. 9 and with reference to Figure 5, describes the use of X-cube beamsplitter 38 to separate incoming light to each of four sensors (30R, 30G, 30B, and 30BG) in a camera. As described on p. 9, the X-cube beamsplitter is polarization-sensitive to blue and red wavelengths and passes green wavelengths of either s- or p-polarization as well as blue wavelengths of one polarization. Thus, different handling of the light is needed, not only because X-cube beamsplitter 38 is separating light into its component colors, but also because of this different behavior for polarization of red and blue wavelengths. Claim 9 is cancelled. Claim 8 is amended to include the X-cube beamsplitter originally claimed in claim 9, with the color filter needed to correct for some leakage of red light through the X-cube.

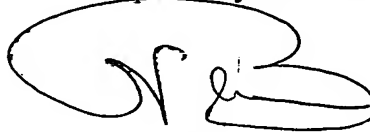
### CONCLUSION

Dependent claims not specifically addressed add additional limitations to the independent claims, which have been distinguished from the prior art and are therefore also patentable.

In conclusion, none of the prior art cited by the Examiner discloses the limitations of the claims of the present invention, either individually or in combination. Therefore, it is believed that the claims are allowable, as amended.

If the Examiner is of the opinion that additional modifications to the claims are necessary to place the application in condition for allowance, he is invited to contact Applicant's attorney at the number listed below for a telephone interview and Examiner's amendment.

Respectfully submitted,



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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

Enclosures: Replacement Figure 10  
Annotated Sheet Showing Changes  
Copy of Letter to Official Draftsperson  
Copies of Formal Drawings  
Fee Transmittal  
PTO-2038 (original and copy)

**Amendments to the Drawings:**

The attached drawing sheet show changes made to Figure 10 (FIG. 10) as requested by the Office Action. This sheet replaces the original Figure 10.

A copy of the formal drawings are submitted herewith with a copy of the Letter to the Official Draftsperson which incorporates the changes required by the Examiner. Approval by the Examiner is respectfully requested.

Attachment: Replacement Figure 10  
Annotated Sheet Showing Changes

